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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,965	02/08/2002	Bryan J. Donoghue	922-152	7935

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EXAMINER	
PHAN, MAN U	
ART UNIT	**PAPER NUMBER**
2616	

DATE MAILED: 05/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/067,965	DONOGHUE ET AL.	
	Examiner	Art Unit	
	Man Phan	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11,13 and 14* is/are rejected.

7)☒ Claim(s) *10 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/5/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment and Argument

1. This communication is in response to applicant's 02/16/2006 response in the application of Donoghue et al. for the "cascade control system for networks units" filed 02/08/2002. This application claims Foreign Priority based on the application 0130815.4 filed December 22, 2001 in United Kingdom. The amendment and response has been entered and made of record. Claims 1-12 have been amended and new claims 13-14 have been added. Claims 1-14 are pending in the application.

In view of applicant's amendment to amend the claims to obviate the claim objection, the examiner has withdrawn the Objections of record.

The rejection of record with respect to claims under 35 U.S.C. 112, second paragraph are hereby removed based on applicant's amendment.

2. Applicant's amendment and argument to the rejected claims are insufficient to distinguish the claimed invention from the cited prior arts or overcome the rejection of said claims under 35 U.S.C. 103 as discussed below. Applicant's argument with respect to the pending claims have been fully considered, but they are not persuasive for at least the following reasons.

3. Applicant's argument with respect to the rejected claims that the cited references fails to disclose or suggest "the use of control frame on a control path separate from the data path for data packets" as claimed. The Applicant's attention is directed to the Fig. 1 of US#6,594,231, in

which Byham discloses a hub unit 10 which has two duplex ports, a first port 11, conveniently called `down` port and a second port 12, conveniently called `up` port. The unit 10 has two signal paths. A first path, which for various reasons is preferably termed the arbitration path (*for controlling messages through arbitration unit 107 – Fig. 2*), proceeds from the `down` port 11 of the unit to the `up` port 12. It is convenient to sub-divide the functions of the ports into receive and transmit (Rx and Tx respectively). Thus the arbitration path (*control path*) proceeds from the down Rx terminal to the up Tx terminal. A second or return path 14 extends from the port 12 to the port 11, and in particular from the `up Rx` part of the second port 12 to the `down Tx` part of port 11 (Col. 3, lines 2 plus). Furthermore, As admitted by the Applicant as the prior art (specification, page 3, lines 17 plus), typically network units, such as switches and routers which include a multiplicity of ports for connection to other units or users are commonly made with a fixed number of ports in order to achieve efficiency of manufacture. It is well known to `stack` such units, by which is meant their connection by what is known as a cascade connection, which enables them not only to receive and forward packets from their own ports but also to forward packets to other units in the stack where destination ports are on a unit other than the unit which first received the packet. Packets which are passed between the units for this purpose travel on a cascade connection, which normally comprises a data path (for the packets) and a control path which enables the units to exchange control and status information for a variety of purposes. These paths may be physically separate but need not be. Physically the units may be stackable, though the physical aspect of stacking is not an essential feature of the present invention. Known stacking arrangements are disclosed and exemplified by the Super Stack 3 Switch 3300 made by 3Com Corporation of Santa Clara, Calif. and the Switch 4400 of the same Corporation. As

known in the cascade units such as switch type 4400 (prior art – spec, page 2), a cascade data path and a cascade control path can be maintained irrespective of the operational state of the network units in a stack by means of three-port connectors (known as T-pieces). These connectors have internal hardware processing circuits coupled to a `Down` port, an `Up` port and a module port which is connected to a respective unit. The processing circuits can compute and convey identification numbering (i.e. `UnitIDs`) and an active unit count by means of control frames sent and received at each of the three ports. Therefore, the Examiner maintains that the references cited and applied in the last office actions for the rejection of the claims are maintained in this office action.

Claim Rejections - 35 USC ' 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to

the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-7 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dolphin et al. (US#6,807,182) in view of Byham et al. (US#6,594,231).

With respect to claims 1 and 4, 7 and 13 Dolphin et al. (US#6,807,182) and Byham et al. (US#6,594,231) disclose a novel system and method for stackable hub units which can be stacked or connected so that the units form a single logical entity, according to the essential features of the claims. Dolphin discloses in Fig. 1 a block diagram illustrated a stackable network unit comprising a multiplicity of ports, of which for convenience five ports, numbers 2, 3, 4, 5 and 6 have been illustrated. As will be apparent from Fig. 2, ports 4 and 5 are two physical ports which form part of a trunked connection to a remote switch. Port 6 is a port which is connected by way of a cascade connection to other switches in a stack of switches organised so that the stack effectively forms a single logical unit having as a multiplicity of ports the aggregate of the ports on the devices 1, 21 and 31 (Fig. 2). The switch 1 includes a bus 7, which may convey both packets and status information. Coupled to the bus 7 is a processor (CPU) 8, memory 9, and a switching ASIC 10. Each of the ports 2 to 6 has associated with it a respective port ASIC 2a to 6a respectively. These ASICs each comprise a physical layer device (PHY) which, among other things, converts signals from the format in which they are transmitted between unit 1 and other units into a conventional media independent format

and a media access controller (MAC) which performs certain basic operations on the header portion of a packet to ensure that the packet is sent to the appropriate physical location (Col. 3, lines 59 plus). Dolphin further teaches a protocol engine, in which protocol data from any of the physical ports anywhere in the stack is made to appear to have come from the logical protocol port by forwarding the protocol messages to the unit hosting the logical protocol port. The forwarding mechanism looks at the incoming port number, destination MAC address, the protocol type, and optionally the data within the packet and determines if the packet should be forwarded. If the packet should be forwarded it is sent across the cascade to the unit that has the protocol engine for the trunk port on the same VLAN and with the same trunk ID as the incoming packet. The forwarded packet is the same as the received packet except that it is sent to the unit hosting the protocol engine across the cascade (See Fig. 3, Col. 3, line 28 to Col. 4, line 42).

However, Dolphin does not disclose expressly wherein the unit is responsive to the absence of control messages from one or other of the control links to redirect control data intended for that control link to the other control link. In the same field of endeavor, Byham et al. (US#6,594,231) teaches in Fig. 3 a detailed diagrams illustrated the layout of the stackable unit, inludes a link detector for detecting tile absence of another operative unit connected to the down port to cause data packets on the return pat to bypass the down port and proceed on the arbitration path and for detecting the absence of another operative unit connected to the up port to cause data packets on the arbitration path to bypass the up port and proceed on the repeat path (Col. 7, lines 50 plus).

Regarding claims 2, 3, 6, 14, in addition to features recited in base claim 1 (see rationales disclosed above), Byham also discloses wherein the control data identifies which units are active in the stack, and controlling the forwarding of data packets from the cascade port (See Fig. 3; Col. 4, lines 20-59 and Col. 5, lines 61-65, Col. 6, lines 56-62).

Regarding claim 5, in addition to features recited in base claim 4 (see rationales disclosed above), Byham further discloses wherein the control logic is response to the absence of control messages from an adjacent unit to loop back control data intended for that unit (See Fig. 4; Col. 7, lines 60 plus).

One skilled in the art would have recognized the need for facilitating the cascade control logic for use in a cascaded stack, and would have applied Byham's teaching of the control logic in stackable hub units into Dolphin's novel use of the protocol engines and cascade control architecture for packet-based communication systems. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Byham's method and apparatus for configuration of stackable units in packet-based communications systems into Dolphin's stacked network devices including a protocol engine and distributed trunk ports and method of operating same with the motivation being to provide a method and system for cascade control system for network units.

7. Claims 8-9, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dolphin et al. (US#6,807,182) in view of Byham et al. (US#6,594,231).

With respect to claims 8 and 11, Dolphin et al. (US#6,807,182) and Byham et al. (US#6,594,231) disclose a novel system and method for stackable hub units which can be

stacked or connected so that the units form a single logical entity, according to the essential features of the claims. Dolphin discloses in Fig. 1 a block diagram illustrated a stackable network unit comprising a multiplicity of ports, of which for convenience five ports, numbers 2, 3, 4, 5 and 6 have been illustrated. As will be apparent from Fig. 2, ports 4 and 5 are two physical ports which form part of a trunked connection to a remote switch. Port 6 is a port which is connected by way of a cascade connection to other switches in a stack of switches organised so that the stack effectively forms a single logical unit having as a multiplicity of ports the aggregate of the ports on the devices 1, 21 and 31 (Fig. 2). The switch 1 includes a bus 7, which may convey both packets and status information. Coupled to the bus 7 is a processor (CPU) 8, memory 9, and a switching ASIC 10. Each of the ports 2 to 6 has associated with it a respective port ASIC 2a to 6a respectively. These ASICs each comprise a physical layer device (PHY) which, among other things, converts signals from the format in which they are transmitted between unit 1 and other units into a conventional media independent format and a media access controller (MAC) which performs certain basic operations on the header portion of a packet to ensure that the packet is sent to the appropriate physical location (Col. 3, lines 59 plus). Dolphin further teaches a protocol engine, in which protocol data from any of the physical ports anywhere in the stack is made to appear to have come from the logical protocol port by forwarding the protocol messages to the unit hosting the logical protocol port. The forwarding mechanism looks at the incoming port number, destination MAC address, the protocol type, and optionally the data within the packet and determines if the packet should be forwarded. If the packet should be forwarded it is sent across the cascade to the unit that has the protocol engine for the trunk port on the same VLAN and with the same trunk ID as the

incoming packet. The forwarded packet is the same as the received packet except that it is sent to the unit hosting the protocol engine across the cascade (See Fig. 3, Col. 3, line 28 to Col. 4, line 42).

However, Dolphin does not disclose expressly wherein the unit is responsive to the absence of control messages from one or other of the control links to redirect control data intended for that control link to the other control link. In the same field of endeavor, Byham et al. (US#6,594,231) teaches in Fig. 3 a detailed diagrams illustrated the layout of the stackable unit, inludes a link detector for detecting tile absence of another operative unit connected to the down port to cause data packets on the return pat to bypass the down port and proceed on the arbitration path and for detecting the absence of another operative unit connected to the up port to cause data packets on the arbitration path to bypass the up port and proceed on the repeat path (Col. 7, lines 50 plus).

Regarding claim 9, in addition to features recited in base claim 8 (see rationales disclosed above), Byham also discloses wherein controlling the forwarding of data packets from the cascade port (See Fig. 3; Col. 5, lines 61-65, Col. 6, lines 56-62). Byham further discloses the loop back of data intended for the first port extends from the first storage means to the second storage means and the loop back of data intended for the second port extends from the second storage means to the first storage means (See Figs. 1, 4; Col. 3, lines 2 plus and Col. 5, lines 10 plus).

One skilled in the art would have recognized the need for facilitating the cascade control logic for use in a cascaded stack, and would have applied Byham's teaching of the control logic in stackable hub units into Dolphin's novel use of the protocol engines and cascade control

architecture for packet-based communication systems. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Byham's method and apparatus for configuration of stackable units in packet-based communications systems into Dolphin's stacked network devices including a protocol engine and distributed trunk ports and method of operating same with the motivation being to provide a method and system for cascade control system for network units.

Allowable Subject Matter

8. Claims 10 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest wherein the first storage means comprises a first set of registers for data from control frames received at the second port and a second set of registers for providing data for control frames forwarded from the first port; the second storage means comprises a third set of registers for data received from control frames at the first port; and wherein the second set of registers and the first port are selectively coupled to the third set of storage registers and the third set of storage registers and the second port are selectively coupled to the first set of storage registers; wherein each network unit has at least two cascade ports and each units is responsive to control data from the control messages to control the switching engine to redirect data packets otherwise intended for each cascade port of the network unit to a different cascade port of the same network unit, as specifically recited in the

claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chen et al. (US#6,373,840) discloses a stackable networking device and method having a switch control circuit.

Merchant et al. (US#6,546,010) discloses a bandwidth efficiency in cascaded scheme.

Fite, Jr. et al. (US#6,496,502) discloses a distributed multi-link trunking method and apparatus.

Salett et al. (US#6,490,276) discloses a stackable switch port collapse mechanism.

Muller et al. (US#5,938,736) discloses a search engine architecture for a high performance multi-layer switch element.

Ammitzboell (US#6,934,292) discloses a method and system for emulating a single router in a switch stack.

Huang (US#2002/0046271) discloses a single switch image for a stack of switches.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION THIS ACTION IS MADE FINAL**. See MPEP ' 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (571) 272-3149.

The examiner can normally be reached on Mon - Fri from 6:00 to 3:00 EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin, can be reached on (571) 272-3134. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at toll free 1-866-217-9197.

Mphan

04/29/2006.

MAN U. PHAN
PRIMARY EXAMINER